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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/814,061	ASH ET AL.
	Examiner	Art Unit	
	Marc Duncan	2113	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _21 February 2007_.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-28_ is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1,2,4,7,9,12,13,15,18,23,24 and 26_ is/are rejected.

7) ☒ Claim(s) _3,5,6,8,10,11,14,16,17,19-22,25,27 and 28_ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on _31 March 2004_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All   b) ☐ Some * c) ☐ None of:

         1. ☐ Certified copies of the priority documents have been received.

         2. ☐ Certified copies of the priority documents have been received in Application No. _____.

         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
     Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

FINAL REJECTION

Status of the Claims

Claims 7 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Edwards et al. (5,649,090).

Claims 1-2, 12-13 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beardsley et al. (6,061,750) in view of Edwards et al. (5,649,090).

Claims 4, 15 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beardsley and Edwards as applied to claims above, and further in view of Beardsley (6,513,097).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Edwards in view of Beardsley (097).

Claims 3, 5-6, 8, 10-11, 14, 16-17, 19-22, 25 and 27-28 are objected to.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Edwards et al. (5,649,090).

Regarding claim 7:

Edwards teaches:

identifying selected pages of the first cache (col. 8 lines 65-66);

marking each of said selected pages as unavailable (col. 7 lines 41-43 and lines 46-52); and

after all of said selected pages are marked as unavailable, removing the selected pages from the first cache (col. 7 lines 52-55 and col. 9 lines 4-5).

Regarding claim 18:

The claim is rejected as the system for performing the method of claim 7.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2, 12-13 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beardsley et al. (6,061,750) in view of Edwards et al. (5,649,090).

Regarding claim 1:

Beardsley teaches:

A method of operating a storage controller (Fig. 3 – 2) for interfacing between a plurality of host systems (Fig. 3 – 34 and 36) and a direct access storage devices system (Fig. 3 – 4 and 6), the storage controller including a first cluster including a first processor and a first cache (Fig. 3 – 12, 16), and a second cluster including a second processor and a second cache (Fig. 3 – 14, 18, the method comprising:

directing data from the host systems through first and second data paths in the storage controller to the direct access storage system, wherein the first processor and the first cache are associated with the first data path, and the second processor and the second cache are associated with the second data path (col. 2 line 66-col. 3 line 15);

under a first set of defined conditions, entering into a failover mode, wherein data directed to the first data path are routed to the second data path (col. 3 lines 15-22).

Beardsley does not explicitly teach under a second set of defined conditions, deconfiguring the first cache without entering the failover mode. Beardsley does, however, teach a method of handling failures such that the storage controller can continue to operate.

Edwards teaches deconfiguring a first cache without entering a failover mode (col. 1 lines 51-52).

It would have been obvious to one of ordinary skill in the art at the time of

invention to combine the cache deconfiguration of Edwards with the fault handling of

Beardsley.

One of ordinary skill in the art would have been motivated to make the

combination because Edwards teaches that by merely deconfiguring the isolated cache

element, the processor can continue to execute without substantial performance loss

(col. 2 lines 52-54).

Regarding claim 2:

Edwards teaches:

identifying selected pages of the first cache (col. 8 lines 65-66);

marking each of said selected pages as unavailable (col. 7 lines 41-43 and lines

46-52); and

after all of said selected pages are marked as unavailable, removing the selected

pages from the first cache (col. 7 lines 52-55 and col. 9 lines 4-5).

Regarding claims 12 and 13:

The claims are rejected as the systems for performing the methods of claims 1

and 2, respectively.

Regarding claims 23 and 24:

The claims are rejected as the program storage device that causes the methods of claims 1 and 2 to be performed.

Claims 4, 15 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beardsley and Edwards as applied to claims above, and further in view of Beardsley (6,513,097).

Regarding claim 4:

The teachings of Beardsley (750) and Edwards are outlined above.

Beardsley (750) and Edwards do not explicitly teach for each of the selected pages, determining whether the page is modified or unmodified; and

if the page is modified, processing the page according to a defined routine, and then marking the page as unavailable.

Beardsley (750) and Edwards do, however, teach removing portions of cache that have failed from use.

Beardsley (097) teaches for each of the selected pages, determining whether the page is modified or unmodified (Abstract lines 12-15);

and if the page is modified, processing the page according to a defined routine, and then marking the page as unavailable (Abstract lines 16-19).

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the scan and destage operations of Beardsley (097) with the cache disabling of Beardsley (750) and Edwards.

One of ordinary skill in the art would have been motivated to make the combination because identifying and processing modified data helps to ensure data integrity (Beardsley '097 col. 2 lines 31-40).

Regarding claim 15:

The claim is rejected as the system for performing the method of claim 4.

Regarding claim 26:

The claim is rejected as the program storage device that causes the methods of claims 4 to be performed.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Edwards in view of Beardsley (097).

Regarding claim 9:

The teachings of Edwards are outlined above.

Edwards does not explicitly teach for each of the selected pages, determining whether the page is modified or unmodified; and

if the page is modified, processing the page according to a defined routine, and then marking the page as unavailable.

Edwards does, however, teach removing portions of cache that have failed from use.

Beardsley (097) teaches for each of the selected pages, determining whether the

page is modified or unmodified (Abstract lines 12-15);

and if the page is modified, processing the page according to a defined routine,

and then marking the page as unavailable (Abstract lines 16-19).

It would have been obvious to one of ordinary skill in the art at the time of

invention to combine the scan and destage operations of Beardsley (097) with the

cache disabling of Edwards.

One of ordinary skill in the art would have been motivated to make the

combination because identifying and processing modified data helps to ensure data

integrity (Beardsley '097 col. 2 lines 31-40).

Allowable Subject Matter

Claims 3, 5-6, 8, 10-11, 14, 16-17, 19-22, 25 and 27-28 are objected to as being

dependent upon a rejected base claim, but would be allowable if rewritten in

independent form including all of the limitations of the base claim and any intervening

claims.

Response to Arguments

Applicant's arguments filed 2/21/07 have been fully considered but they are not

persuasive.

Applicant argues, on page 11, that Edwards does not teach the limitations of

claims 7 and 18. The examiner respectfully disagrees.

Specifically, applicant argues that Edwards does not teach identifying selected cache pages. The examiner respectfully disagrees. Edwards teaches identifying blocks of a cache that contain errors. The examiner considers the pages of instant claim to be equivalent to the blocks of Edwards, pages being merely an arbitrary designation for a fixed sized memory block. Thus, identifying blocks of a cache is clearly equivalent to identifying selected cache pages.

Applicant further argues that Edwards does not teach marking the selected pages as unavailable. The examiner respectfully disagrees. Edwards teaches invalidating the blocks that have been identified. This effectively "marks" the blocks by not allowing data in those blocks to be used.

Applicant argues that Edwards does not teach removing the selected pages from the first cache. The examiner disagrees. Edwards teaches disabling the blocks that have been identified from the cache. This is clearly equivalent to removing them from the cache. In response to applicant's argument that Edwards is not concerned with individual pages, the examiner reiterates that pages are an arbitrarily sized block of memory and thus are considered equivalent to the blocks of Edwards.

Applicant argues, on pages 12-13, that there is no motivation present for combining the Beardsley I and Edwards references. The examiner respectfully disagrees. The examiner clearly provided motivation from the Edwards reference in that Edwards teaches that a processor can continue to operate in the face of an error without substantial performance loss by utilizing the cache deconfiguration technique. This is clearly the expectation of some advantage to be gained by using the technique

and, as the examiner believes applicant is aware, the expectation of some advantage is the strongest motivation to combine.

Applicant argues, on page 13, that applicant's invention is not constructed as is the Edwards reference, for deconfiguring a cache, but for deconfiguring pages in a cache. The examiner disagrees. Applicant has very clearly claimed "deconfiguring the first cache" in the last two lines of claim 1. There, it is evident that applicant's invention does, in fact, involve deconfiguring the cache.

Applicant argues, on page 13, that Beardsley I does not route data to a second path. The examiner respectfully disagrees. Beardsley clearly teaches that when failing over, data is sent through the second host adaptor and device adaptor. This is clearly a second path and therefore Beardsley I absolutely teaches routing data over a second path when failing over. The fact that the specific word "routing" may not be used has no bearing on the fact that the concept is taught.

Applicant argues, on pages 14-15, that there is no motivation for combining the Edwards and Beardsley II reference. Again, as stated above, expectation of some advantage is the strongest motivation for combining. In this case, Beardsley II teaches that identifying and processing modified data ensures data integrity. Ensuring data integrity is quite clearly an advantage and thus proper motivation exists for the combination.

Applicant argues, on page 15, that Edwards does not teach deconfiguring a first cache without failing over. The examiner disagrees. Edwards teaches deconfiguring

the cache in the cited sections. Edwards does not, in the cited section, teach doing the deconfiguring in combination with failing over.

Applicant further argues, on page 15, that Beardsley II does not teach processing a modified page according to a defined routine and marking the page as unavailable. Applicant has provided no evidence or reasoning to support this assertion, merely an allegation that it is true. The rejection is maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc Duncan whose telephone number is 571-272-3646. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on 571-272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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